In Summary

- In 1994, a hunter in southwestern Alpena County shot a deer with bovine TB. Since the fall of 1995, surveys for bovine TB have been conducted statewide. As of October 2005, 509 deer, four elk and several coyotes, raccoons, black bear, bobcats, red fox and opossums have been found to be bovine TB-positive. Over 96 percent of the bovine TB infected deer have come from a five-county area (Alpena, Alcona, Montmorency, Oscoda and Presque Isle).
- At this time, bovine TB has been confirmed in 33 cattle herds. No new positive herds were found in the last testing season. Two human cases of bovine TB in Michigan have been diagnosed with the same unique strain that is found in deer and cattle. One domestic cat from northeastern lower Michigan was also found to be infected with bovine TB.
- If you see a deer with lungs containing tan or yellow lumps characteristic of a bovine TB infection (see picture), bring the carcass to any DNR field office or check station.
- A multi-agency committee continues to address the bovine TB problem through educating the public; providing skin tests to people thought to be exposed to bovine TB; surveying wildlife populations; testing livestock; regulating feeding and baiting of deer; and managing the deer population at a level where disease does not easily spread.

For additional information about bovine TB, contact one of the agencies listed on the back page or visit the *Bovine Tuberculosis in Michigan* Web site at:

www.michigan.gov/bovinetb

Contact e-mail addresses are located on the Web.

Numbers of copies printed: 500,000; Total Cost: $22,460.00; Cost per copy: $0.045
8-05

Who to Contact

For information regarding bovine TB as it relates to wildlife, domestic animals, or people consult one of the agencies listed below:

Wildlife

Michigan Department of Natural Resources
Wildlife Disease Laboratory
4125 Beaumont Road, Room 250
Lansing, MI 48910-8389
517-336-5030

U.S. Department of Agriculture
APHIS Wildlife Services
2803 Jolly Road, Suite 100
Okemos, MI 48864
517-336-1928

Domestic Livestock

Michigan Department of Agriculture
Animal Industry Division
525 West Allegan
P.O. Box 30017
Lansing, MI 48909
517-241-4904

U.S. Department of Agriculture
APHIS, Veterinary Services
3001 Coolidge Road, Suite 325
East Lansing, MI 48823
517-324-5290

Michigan State University, DCPAH
P.O. Box 30076
Lansing, MI 48909-7576
517-353-5275

Michigan State University Extension
603 S. Eleventh Avenue
Alpena, MI 49707-2645
517-354-0800

People

Michigan Department of Community Health
Division of Communicable Diseases
P.O. Box 30195
Lansing, MI 48909
517-335-8165
Or contact your local county health department.

Bovine Tuberculosis

in Michigan

August 2005

Michigan Department of Natural Resources
Michigan Department of Agriculture
Michigan Department of Community Health
United States Department of Agriculture
Michigan State University

General Information

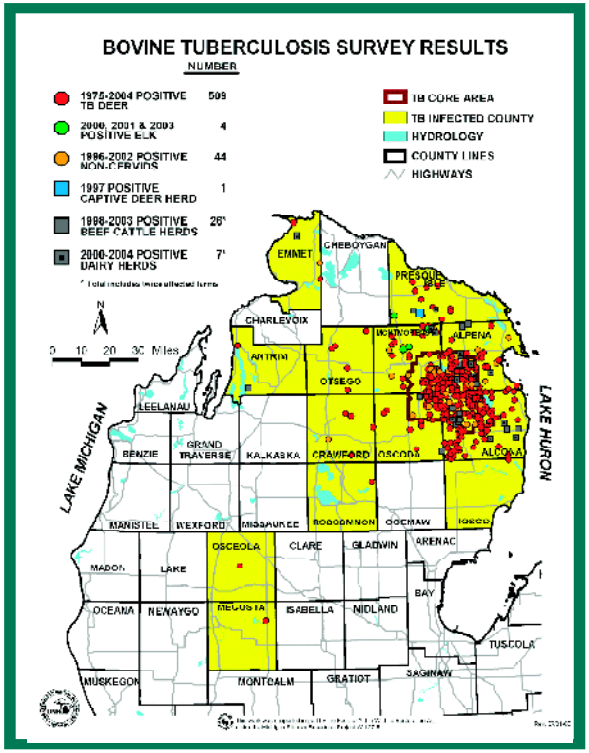
Tuberculosis (TB) is a serious disease caused when bacteria attack the respiratory system. There are three main types of TB – human, avian, and bovine. Human TB is rarely transmitted to animals; avian TB is typically restricted to birds (pigs and occasionally other animals have been found to be susceptible); and bovine TB – or cattle TB – is the most infectious, capable of infecting most mammals.

Although bovine TB was once relatively common in cattle in the U.S., it has historically been a very rare disease in wild deer. Prior to 1994, only eight previous occurrences of TB in wild deer had been reported in North America.

In 1994, a hunter in southwestern Alpena County shot a 4-year-old male white-tailed deer infected with bovine TB. The only other time TB was found in a wild deer in Michigan was in 1975, when a hunter killed a 9-year-old bovine TB-infected female white-tailed deer in Alcona County.

To assess the extent of the bovine TB infection in the wild deer and elk population, 138,567 deer and 1,402 elk were examined from the fall of 1995 to the summer of 2005.

To date, 509 deer and four elk have tested positive for bovine TB. Bovine TB has also been found in coyotes, raccoons, black bear, red fox, opossum and bobcats from Alcona, Alpena, Crawford, Emmet, Montmorency, Oscoda and Presque Isle counties.



The most likely source of infection for these animals is through eating the lungs and lymph nodes of a TB-infected deer.

Bovine TB has been confirmed in one privately owned deer and elk herd and 33 cattle herds. The majority were found in the High Risk Area (Alcona, Alpena, Montmorency and Presque Isle counties). No infected wild deer have been found outside the 13 counties, shown in color on the map. Over 96 percent of all positive wild deer were found in just five counties (Alpena, Alcona, Montmorency, Oscoda and Presque Isle).

The presence of bovine TB in Michigan's white-tailed deer is a serious problem. At risk are Michigan's deer herd and other wildlife species with their many social, ecological, and economic values; Michigan's livestock industry; and, most importantly, the health of Michigan's citizens.

To address this serious and difficult situation, a multiagency committee composed of individuals with diverse expertise and jurisdiction was formed.

A management strategy recommended by the committee includes surveying wildlife populations; testing and culling livestock; establishing quarantines and depopulating TB-positive cattle farms; eliminating feeding and baiting of deer; reducing the deer density through legal hunting in areas of Michigan where bovine TB has been found and educating the public.

Types of Tuberculosis

Tuberculosis in People

Human TB is generally transmitted from person to person through the air by sneezing or coughing. It is possible to transmit bovine TB from animals to people and two individuals from Michigan have had this particular strain of bovine TB. The Michigan Department of Community Health and the DNR recommend the use of gloves when field dressing deer. It is unlikely that a person eating adequately cooked meat of a deer infected with bovine TB would become infected.

Tuberculosis in Livestock

Bovine TB may be spread between livestock through the air or by consumption of contaminated water, feed, or milk. Treatment for bovine TB is not feasible in livestock. The most effective means of controlling the disease is by destroying infected and exposed animals.

Tuberculosis in Wild Deer

Tuberculosis is spread primarily through the air when an infected animal is in close contact with other animals. Bacteria released into the air through coughing and sneezing can spread the disease. Research shows that bovine TB can also be contracted from contaminated feed and the bacteria can live for months on feed in cold weather.

Close contact between animals and exposed contaminated feed at feeding stations and bait piles has been determined to be an important site of transmission in deer.

Bovine TB is a chronic disease in deer and it can take years for lesions to develop in the lungs. In the 1996-2004 surveys, 39 percent of the TB positive deer had lesions in the chest cavity or lungs that would be recognized as unusual by most deer hunters. These deer had tan or yellow lumps on the inside surface of the rib cage or in the lung tissue.

Management Strategies to Eliminate Bovine TB in Wild Deer

Strategies for eradication of TB from Michigan wildlife continue to focus on 1) reducing deer population densities to biological carrying capacity and 2) reducing artificial congregation of deer by restriction or elimination of baiting and feeding. These strategies have been implemented through provision of extra rifle seasons and unlimited antlerless deer permits, and by prohibition or restriction of deer baiting and feeding. In the five-county area most affected by TB, deer numbers have declined by half since 1995.

The achievement of this substantial population reduction highlights the critical role that hunters have played in the control of TB in Michigan. Nonetheless, persistent focal areas of high density on private land remain problematic. Since 2002, baiting and feeding have been prohibited in the seven counties from which 98 percent of all TB-positive deer have originated. Policy makers have committed to keeping these regulations consistent for a five-year period in order to improve compliance and enforcement. The overall scope of baiting and feeding has declined dramatically since 1997, with large scale feeding largely a thing of the past. While some illegal baiting and feeding occurs, the size of these sites is substantially reduced, and heightened enforcement is expected to reduce the practice further over the next several years.

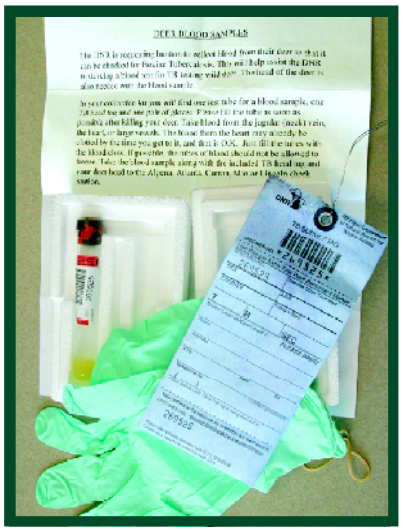
New Information for Hunters

Michigan's TB intervention strategies are working; however, it is too early to claim victory in eradicating the disease. The need to stay the course in this disease eradication effort is extremely important. The current measured successes validate the project protocols and lead experts to believe that we are on our way to eliminating bovine TB from the environment.

With that in mind, the State of Michigan is evaluating a new intervention strategy that may work well for many hunters and landowners. The new strategy is based on live-trapping and TB-testing of wild deer, and removal of positive animals in high TB prevalence areas. This strategy is not intended to replace initial strategies, but may assist them in eliminating TB from the deer herd.

An effort to develop a more accurate blood testing procedure was the focus of a pilot during the 2004 hunting season. Hunters were asked to collect blood from deer harvested in DMU 452, and to submit the blood and deer head to a deer check station. The lymph nodes from the deer heads were cultured for TB and culture results compared with results from four TB blood tests.

One blood test (Rapid Test), that can be done in 10-15 minutes in the field with whole blood, looks promising. Further trials with this test may show it to be acceptably accurate for the purposes of the new strategy. However, success is far from guaranteed. It may be years before this approach is ready for widespread field use. In the meantime, keeping deer densities down and eliminating feeding and baiting in TB areas remains more important than ever.



DNR Blood Test Kit

Prevention/Control Methods for People

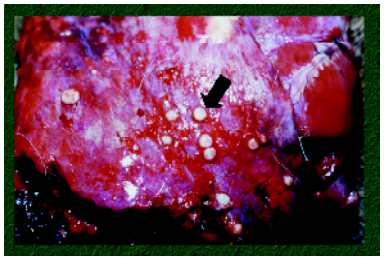
People can be skin-tested to determine if they are infected with TB. These simple tests can be done at either the local health department or a private physician's office. A positive skin test, however, does not identify the type or source of the infection. Remember, people most commonly get human TB, and they get it from other people.

In 2004, an individual hunter contracted the disease through a puncture wound while field dressing a bovine TB positive deer. It is highly unlikely that a person could contract bovine TB by eating the adequately cooked meat of an infected animal.

There is no specific test that can be easily done to check for bovine TB in meat; however, cooking readily kills the organism. It is recommended that all meat from any animal taken be thoroughly cooked to an internal temperature of 165 degrees F for 15 seconds, until it is no longer pink and any juice from the meat is clear, not red or pink.

If the lungs or ribcage from any animal looks abnormal, the meat should not be eaten and the tissues taken to a DNR office or check station.

A disease control replacement permit may be issued to a person who voluntarily surrenders the carcass of a legally harvested deer or elk, if the deer or elk has visible lesions that department field staff suspects to be bovine TB.

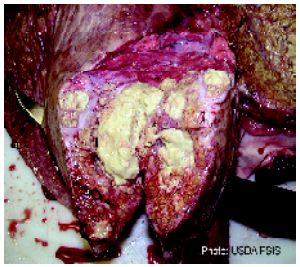


Surface of deer lung with bovine TB nodules

Hunters, please examine the ribcage and viscera of deer taken from anywhere in the state. If you see anything that resembles this photo, please submit the deer and the viscera to any DNR office or check station.

Prevention/Control in Livestock

In 1917 the federal government instituted an eradication program for bovine TB. This program includes testing of livestock on farms and monitoring of animals sent to slaughter or transported across state lines. As a result of this program, bovine TB has almost been eradicated from cattle in the United States.



Bovine TB in the lungs of a heifer

Michigan was declared free of bovine TB in 1979. The recent bovine TB infection in the wild white-tailed deer population and in livestock in Michigan resulted in the loss of Michigan's Bovine TB Accredited-Free State status in 2000.

To better understand the geographic location of the disease, testing of livestock increased throughout the state. From the spring of 1995 through March 2004, all herds in Michigan were tested - over one million livestock (cattle, bison and goats) and over 16,500 privately owned deer and elk - for bovine TB. One of the results of this comprehensive surveillance in both deer and cattle was the awarding of Split State Status to Michigan by the national bovine TB eradication program in 2004.

Cattle Testing

Random surveillance testing continues statewide. This is a USDA requirement to move Michigan forward to TB Free Status. All cattle from the TB endemic area - the Modified Accredited Zone - must undergo an annual whole herd test and have an individual animal test in order to move from a farm.

Before moving cattle from one zone to another, producers should contact the Michigan Department of Agriculture for recent rules and regulations.

Prevention Methods

Research shows that Tuberculosis bacteria from deer and cattle can live for months on feed. To prevent transmission from wildlife to cattle, producers are expected to follow these simple measures;

- If cattle are fed outside, feed them in open areas away from deer cover.
- Store hay where deer can't get to it.
- Do not leave hay bales in the fields.
- Fence in feed bunkers to exclude deer.
- Use livestock guardian dogs to keep deer away from cattle.

Michigan livestock producers have made great strides in the disease eradication effort. However, even one positive herd can set the bovine TB area back in the effort to achieve TB free status.

Prevention & Monitoring in Wild Deer

Since 1994, the state of Michigan has recognized bovine TB infection in wild white-tailed deer from a 13-county area in northeastern Lower Michigan.

In 2004, surveillance activities for bovine TB continued statewide, with an emphasis on the northern half of the Lower Peninsula. In 2004, 28 white-tailed deer cultured positive from 15,129 submitted for testing. Since the index cases were first identified, 138,567 free-ranging deer have been tested for bovine Tuberculosis; 509 infected animals have been found.

Research of the disease is revealing a clustered pattern. Of all positive deer identified to date, 96 percent originated from the five-county area. Moreover, within that area, the vast majority of positive deer were from DMU 452. Even within DMU 452, the arrangement of cases is highly clustered, in spite of the fact that the sampling effort has been relatively uniform geographically. While much work remains, substantial progress has been made toward eradication of TB from Michigan wildlife. Apparent prevalence in DMU 452, was 1.7 percent in deer in 2004, a decrease of 64 percent compared to1997.

Scientists, biologists, epidemiologists, and veterinarians have determined that an important factor, related to bovine TB infection, is white-tailed deer congregating in unnaturally high numbers at feed sites. The gathering of groups of deer for prolonged periods of time enhances the potential for spreading the disease among infected deer. The goal is to stop feeding and baiting in an area large enough to lessen the likelihood of infected deer coming into close contact with healthy deer.

By halting feeding and baiting, and reducing the deer population in the area where bovine TB is found, deer concentrations will be lowered.

It is thought that over a period of years, these measures will reduce the risk of transmitting bovine TB between animals and will eliminate bovine TB in Michigan's wild deer, making this a short footnote in the history of the wild deer population.

Deer congregating at an artificial winter feed site.